Name of Policy:	**MetaNeb™ Therapy**
Policy Number:	3364-136-04-09
Department:	Respiratory Care
Approving Officer:	Associate VP Patient Care Services / CNO
Responsible Agent:	Director, Respiratory Care
Scope:	The University of Toledo Medical Center Respiratory Care Department

THE UNIVERSITY OF TOLEDO MEDICAL CENTER

Effective Date: 9/1/2020
Initial Effective Date: 8/1/2017

_____ New policy proposal	_____ Minor/technical revision of existing policy
_____ Major revision of existing policy	**X** Reaffirmation of existing policy

(A) Policy Statement

MetaNeb™ is a therapeutic device that utilizes a systematic approach to enhance normal mucous clearance and resolve or prevent patchy atelectasis. Initiation of the MetaNeb™ System will be determined as outlined in the Therapist Driven Protocols.

(B) Purpose of Policy

To provide guidelines for the appropriate initiation of the MetaNeb™ System.

Indications

The MetaNeb™ System is indicated when mobilization of secretions, lung expansion and treatment and prevention of pulmonary atelectasis is indicated.

Contraindications

Absolute
Untreated tension pneumothorax

Relative
History of pneumothorax
Pulmonary air leak
Recent pneumonectomy
Pulmonary hemorrhage
Myocardial infarction
Vomiting

Possible Adverse Reactions
Hyperventilation
Gastric distension
Decreased cardiac output
Increased intracranial pressure
Increased air trapping
Hyperoxygenation
Pneumothorax
Pulmonary air leak
Pulmonary hemorrhage

MetaNeb™ Modes of Therapy

- CHFO (Continuous High Frequency Oscillation) – a pneumatic form of chest physiotherapy that delivers medicated aerosol while oscillating the airways with continuous pulses of positive pressure.
- CPEP (Continuous Positive Expiratory Pressure) – supplies medicated aerosol combined with continuous positive pressure to help hold open and expand the airways.
- Aerosol – for the delivery of aerosol only. In this mode CHFO and CPEP are not available.

(C) Procedure

Assembly of Circuit

1. Put the circuit tri-connector/bio-filter into the tri-connector port on the control unit.
2. Turn the connector 45° counterclockwise to lock it into position.
3. Attach the mouthpiece to the handset: insert the mouthpiece at a 45° angle and gently push it in and twist it to the correct orientation.
4. Remove the nebulizer from the package.
5. Assemble the nebulizer and add the prescribed medication.
6. Connect the nebulizer to the nebulizer port on the bottom of the handset.
7. Connect, but do not twist, the nebulizer hose of the tubing to the bottom of the nebulizer. Make sure to push the bushing all the way on to the nebulizer stem.

Add Medication to the Nebulizer

1. Remove the container cap from the nebulizer.
2. If the green cone is not already installed, put the green cone into the container.
3. Fill the container with the prescribed medication. The minimum capacity of the nebulizer is 1 ml and the maximum capacity is 5 ml.
4. Install and tighten the container cap on to the container. Make sure the green cone in the container stays in position.

PRE-USE CHECK – Perform before each use:

Non-ventilator patient – Pre-Use Check

1. Connect the gas hose to a 50 psi oxygen source.
2. Connect the circuit to the controller.
3. Set the mode to **CHFO**, and select **Higher**.
4. Set the selector ring on the handset to the **three-dot** position.
5. Put the master switch in the **ON** position.
6. Occlude the patient opening of the handset.
7. Watch the pressure gauge. The average of pressure fluctuations should not be less than 15 and not more than 30 cmH2O.
8. Set the mode to **CPEP**.
9. Turn the CPEP flow dial counterclockwise to **full flow**.
10. With the selector ring on three dots, occlude the patient opening of the handset and monitor the manometer. Make sure there is a peak pressure occurrence of not less than 20 and not more than 30 cmH2O.

11. If the device is not within the parameters specified above, do not use the unit. Fill out and attach a Biomed equipment repair tag and return the defective unit to the Respiratory Care Department.

Ventilator patient – Pre-Use Check

1. Connect the gas hose to a 50 psi oxygen source.
2. Connect the circuit to the controller.
3. Set the mode to **CHFO**, and select **Higher**.
4. Put the master switch in the **ON** position.
5. Occlude the patient opening of the handset.
6. Watch the pressure gauge. The average of pressure fluctuations should not be less than 15 and not more than 40 cmH2O.
7. Set the mode to **CPEP**.
8. Turn the CPEP flow dial counterclockwise to **full flow**.
9. With the black occlusion ring installed, occlude the patient opening of the handset and monitor the manometer. Made sure there is a peak pressure occurrence of not less than 20 and not more than 45 cmH2O.
10. If the device is not within the parameters specified above, do not use the unit. Fill out and attach a Biomed equipment repair tag and return the defective unit to the Respiratory Care Department.

TREATMENT PROTOCOL – Non-ventilator patient

1. Make sure the unit operates as outlined above in Pre-Use Check for non-ventilator patient.
2. Follow appropriate infection control guidelines.
3. Introduce yourself, and explain the procedure to the patient.
4. The patient should be in an upright and comfortable position, if possible.
5. The patient should be assessed prior to initiation of therapy.
6. Fill the nebulizer with the prescribed medications, if applicable.
7. Set the mode to **CPEP**.
8. Turn the CPEP flow dial all the way clockwise to the **lowest** position.
9. Set the selector ring on the handset to the **one-dot** position.
10. Connect the MetaNeb™ System to a 50 psi oxygen source.
11. Put the master switch in the **ON** position.
12. Adjust the CPEP flow to observe the aerosol that comes from the patient end of the handset.
13. Attach the mouthpiece to the handset.

    NOTE: A cushion mask or tracheotomy tube may also be connected to the handset using the appropriate provided adapter.

14. Instruct the patient to inhale normally and exhale slowly (3-4 seconds) through the mouthpiece or facemask.

15. Adjust the selector ring up to the **two-dot** setting for higher resistance or **three-dot** setting for the highest resistance as tolerated by the patient.
16. Encourage the patient to exhale slowly (3-4 seconds).
17. Continue CPEP mode approximately 2 ½ minutes, adjusting the flow to achieve a therapy that is comfortable yet challenging for the patient.
18. Instruct the patient that the mode will now change to CHFO. Proceed with changing the mode to **CHFO**.
19. Move the **Higher/Lower** switch to **Higher**.
20. During the treatment, the selector ring may be adjusted and the **Higher/Lower** switch may be moved to **Lower**.

    NOTE: the Lower setting on the **Higher/Lower** switch reduces the percussion rate and the pressure, and may be used as an introductory therapy.

21. Encourage the patient to inhale normally and exhale slowly (3-4 seconds) against pulsations, keeping his or her cheeks firm to avoid pressure loss.
22. Continue CHFO mode for approximately 2 ½ minutes.
23. Alternate between CPEP and CHFO for 10 minutes or depending on patient need or as otherwise tolerated.

TREATMENT PROTOCOL – Ventilated Patient

1. Make sure the unit operates as outlined above in Pre-Use Check for ventilator patient.
2. Follow appropriate infection control guidelines.
3. Introduce yourself, and explain the procedure to the patient.
4. Make a note of the current ventilator alarm and mode settings.
5. The patient should be in a position to maintain the head of the bed angle at > 30 degrees if possible.
6. The patient should be assessed prior to initiation of therapy.
7. Prepare the handset for in-line use as follows:

    a. Remove the selector ring from the patient end of the handset.
    b. Install the black occlusion ring to make sure the exhalation orifice is blocked.
    c. Use the adapter (15 mm x 22 mm) to connect the handset to the spring-valve tee adapter.

8. Fill the nebulizer with the prescribed medications, if applicable.
9. Connect the MetaNeb™ System to a 50 psi oxygen source.
10. Set the mode to **CHFO** and select **Higher**.

    NOTE: There is no need for CPEP as this therapy can be accomplished with the ventilator.

11. Put the master switch in the **ON** position.
12. Put a spring-valve “tee” adapter into the inspiratory limb of the ventilator circuit.
13. Monitor the patient response to the therapy and continue the treatment for 10 minutes.

NOTE: As secretions mobilize, it is not uncommon for plugs to momentarily occlude the upper airways. Do not leave the patient during the therapy and be prepared to suction.

14. Adjust the alarm parameters as necessary while in-line therapy is performed.

    NOTE: The MetaNeb™ will introduce additional flow into the circuit and may distort readings. Alarm limits will likely need to be temporarily adjusted in order to avoid nuisance alarms.

15. Suction secretions as necessary during the treatment.
16. Once therapy is completed, remove the handset and adapter from the spring-valve tee and cap the spring-valve tee before you put the MetaNeb™ System master switch in the **OFF** position.
17. Return the ventilator alarms and mode to their previous settings.
18. Monitor and document the patient's tolerance during and after the treatment.

Storage of Equipment

When the treatment has been completed, turn the machine off and disconnect the circuit keeping the tubing attached to the bottom of the nebulizer cup and disassemble the top of the nebulizer from the handset. Rinse the nebulizer cup and store the circuit in a clean patient setup bag.

Reference: The MetaNeb™ System User Manual; 174432 Rev 7.

Approved by:		**Review/Revision Date:** 09/01/20
/s/ Michael Taylor Director, Respiratory Care	9/11/20 Date	
/s/ Monecca Smith Associate VP Patient Care Services / CNO	9/13/20 Date	
Review/Revision Completed By: *Director, Respiratory Care*		**Next Review Date:** September 2023
Policies Superseded by This Policy:		